

Appl. No. : 09/771,673
Filed : January 29, 2001

REMARKS

In the final Office Action mailed May 29, 2003, the Examiner rejected all pending claims, Claims 15-24. In the current Amendment, Applicants have amended independent Claim 15. Applicants request entry of the amendments and full consideration of the remarks contained herein.

Amendments to the Claims

Applicants have amended the claims to clarify further the subject matter that Applicants regard as the invention. For example, Applicants have amended independent Claim 15 to recite that the installation is “for etching a substrate by simultaneous exposure to two etching gases, the two etching gases forming a corrosive mixture.” Support for this language can be found in the Application as originally filed. *See, e.g.*, the Application, p. 1. Applicants have also amended Claim 15 to recite “first and second shut-off valves” which “are configured to be open only one at a time.” Support for this language can also be found in the Application as originally filed. *See, e.g.*, the Application, pp. 2 and 6. Claim 15 has also been amended to recite “a third controllable shut-off valve positioned in the piping system in the second fluid feed, wherein the third shut-off valve and the second shut-off valve are configured to be open only one at a time.” Support for this language can also be found in the Application as originally filed. *See, e.g.*, the Application, pp. 5-6. Consequently, Applicants respectfully submit that the amendment adds no new matter and is fully supported by the Application as originally filed.

Rejections Under 35 U.S.C. § 103

The Examiner has rejected Claims 15, 17-18 and 20-24 as being unpatentable over Tohru (EPO 0335313) in view of Mayer (U.S. Pat. No. 6,333,275) and has rejected Claims 15-16 and 18-24 as being unpatentable over Izumi et al. (U.S. Pat. No. 5,022,961) also in view of Mayer. The Examiner has stated that Tohru and Izumi et al. each teach all of the elements of independent Claim 15, except that each “fails to teach first and second fluids feeds, which separately provide gases to the etching chamber.” The Examiner has asserted that Mayer satisfies this deficiency by teaching

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a plurality of feeds ... and etchants ... and their respective sources. Mayer cites the motivation for separate feeds in the abstract. Therein it is explained that providing separate feeds to the etching chamber ensures that the feeds will enter the chamber at the appropriate concentration by mixing the feeds immediately prior to use rather than in the piping system, see Fig. 2A.

Applicants traverse the rejections and submit that the pending claims are patentably distinct.

A. Mayer is Not Available as Prior Art

Applicants note initially that the present Application is a continuation-in-part of PCT Application Ser. No. PCT/NL99/00487, filed July 29, 1999, which claims priority from Netherlands Patent Application No. 1009767, filed July 29, 1998. Consequently, Applicants submit that the subject matter of at least independent Claim 15 has a priority date of at least as early as the PCT Application (July 29, 1999).

Mayer, however, was filed April 25, 2000, nearly one year after the present priority date. As such, Applicants submit that Mayer is not available as prior art with respect to at least Claim 15.

B. Notwithstanding its Non-availability as Prior Art, Mayer Does Not Make Up for the Deficiencies of Tohru and Izumi et al.

Applicants submit that the Examiner has misinterpreted the art of record and that Mayer does not teach all that has been asserted. In particular, Applicants submit that Mayer does not teach individual gas feeds into an etching chamber, each gas feed connected to a different etchant, nor does Mayer teach that the etchants are first mixed inside the etching chamber; rather, while Mayer does teach individual gas feeds, each gas feed delivers the *same pre-mixed* etchant to the etching chamber.

As shown in its Fig. 2A, Mayer teaches two etchant feeds, 256 and 262, to its chamber 222, the feed 256 directed to the edge of the wafer and connected to etchant source 252 and the feed 262 directed to the wafer's backside and connected to the etchant source 258. A block diagram of the reactant flows is show in Mayer's Fig. 5A, with EBR (edge bevel removal)

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indicating the etchant feed directed to the wafer's edge and backside indicating the etchant feed directed to the wafer's backside (BS). Mayer, Fig. 5A, right hand side of figure.

Applicants note, however, that Mayer teaches pre-mixing etchants before feeding the etchants to the feeds EBR or BS and into the etching chamber. In particular, Mayer teaches "mixing the etchant components at *in-line* T 593" so that "the etchant mixing occurs immediately before use." Mayer, Col. 17, lines 14-30 (emphasis added). Applicants note that T 593 precedes the branching off of the feed line into the two feed lines EBR and BS. See Figure 5A. Consequently, by mixing the etchants "immediately before use," Mayer is referring to mixing the etchants *before* entry into the etching chamber, not upon entry into the etching chamber, as the Examiner appears to assume. As such, Applicants submit that because its etchants are pre-mixed before being provided to the etching chamber, Mayer does not teach providing distinct "first and second fluid feeds ... configured to *separately* provide the first and second etching gases to the etching chamber." (emphasis added).

In addition, Mayer teaches that both the sources 252 and 258 shown in Fig. 2A are the *same* etchant source. See Mayer, Col. 9, lines 36-54. Moreover, Mayer provides no teaching or suggestion that the sources 252 and 258 should contain different etchants. Thus, Applicants submit that Mayer does not teach "a *first* fluid feed and a *second* fluid feed, wherein the first fluid feed is connected at a source end to a source of a *first* etching gas, wherein the second fluid feed is connected at a source end to a source of a *second* etching gas, and wherein the first and second fluid feeds are configured to separately provide the first and second etching gases to the etching chamber via the piping system," as recited in Claim 15. (emphasis added).

Consequently, Applicants submit that Mayer does not teach first and second fluid feeds connected to different etching gas sources and providing these etching gases separately to the etching chamber. As such, Mayer does not satisfy the deficiencies of Tohru and Izumi et al. and Applicants respectfully submit that art of record does not establish a *prima facie* case of obviousness.

C. The Rejections are Moot in View of the Amendments to the Claims.

While Applicants submit that the art of record does not establish a *prima facie* case of

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prosecution of the Application. Applicants note that Claim 15 now recites first, second and third controllable shut-off valves and that the “first and second shut-off valves are configured to be open only one at a time” and “the third shut-off valve and the second shut-off valve are configured to be open only one at a time.”

Applicants submit that the limitations of “configured to be open only one at a time” merit patentable weight as they provide clear structural limitations on the physical orientation of the shut-off valves relative to one other. Applicants note that it is well-established that functional language, such as phrases including “configured to,” should be given patentable weight if that language imparts a limitation on the claimed structural features. *See, e.g., In re Venezi*, 189 U.S.P.Q. 149 (CCPA 1976).

With respect to the present claims, Claim 15 specifies particular physical orientations for the first, second and third shut off valves. For example, in cases where the second shut-off valve is oriented to form an opening in the piping system (to allow gas to pass through it), the first and third shut-off valves are **limited to** being oriented in a blocking position to block the piping system (to prevent gas from flowing through them). As explained in the Application, this arrangement prevents diffusion of one etchant source backwardly up the piping toward the second etchant source. Applicants submit that the art of record does not show such an arrangement and, as such, that the rejections are moot.

Accordingly, Applicants submit that the pending claims are allowable over the art of record. Applicants have not addressed the further rejections of dependent claims as being moot in view of the amendments and remarks herein. However, Applicants expressly do not acquiesce in the Examiner’s findings not addressed herein. Indeed, Applicants submit that the dependent claims recite further novel and non-obvious features of particular utility.

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CONCLUSIONS

In view of the foregoing remarks, Applicants respectfully submit that the application is in condition for allowance and request the same. If some issue remains that the Examiner feels may be addressed by Examiner's amendment, the Examiner is invited to call the undersigned for authorization.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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